E. BOMMER.

CHECKING HINGE.

APPLICATION FILED MAY 28, 1914.

1,241,083. Patented Sept. 25, 1917.

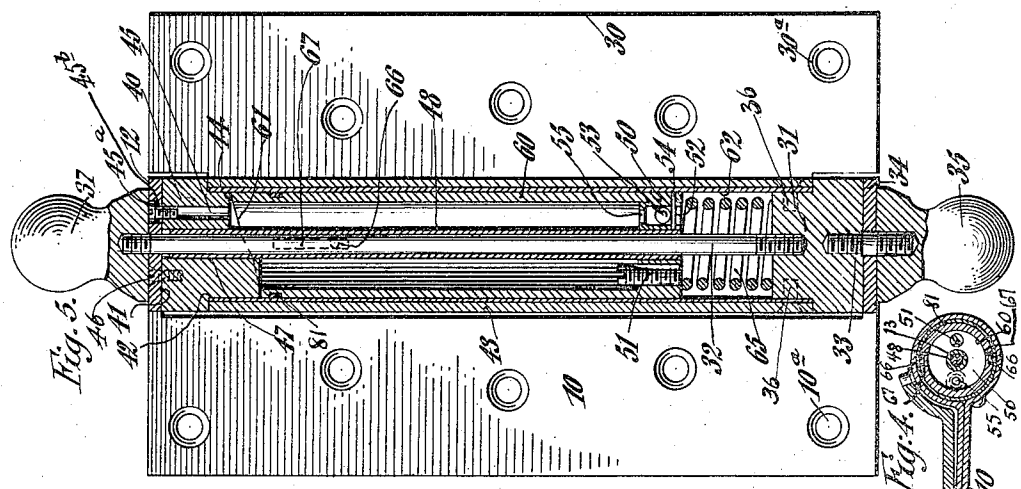


Fig. 5.

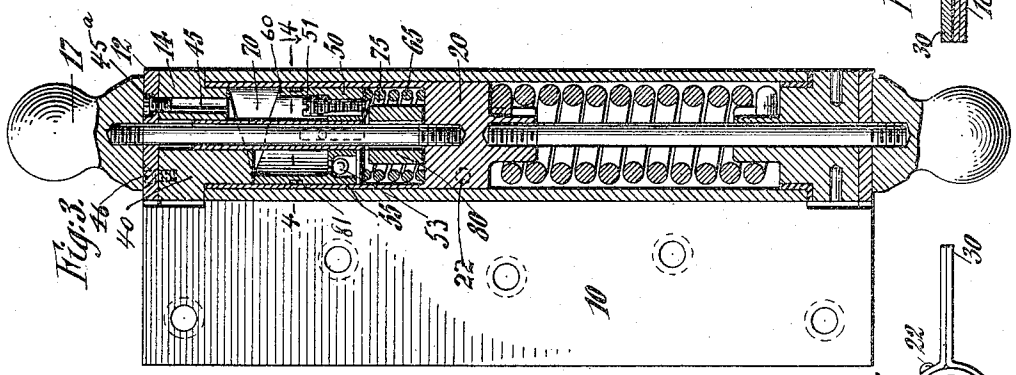


Fig. 3.

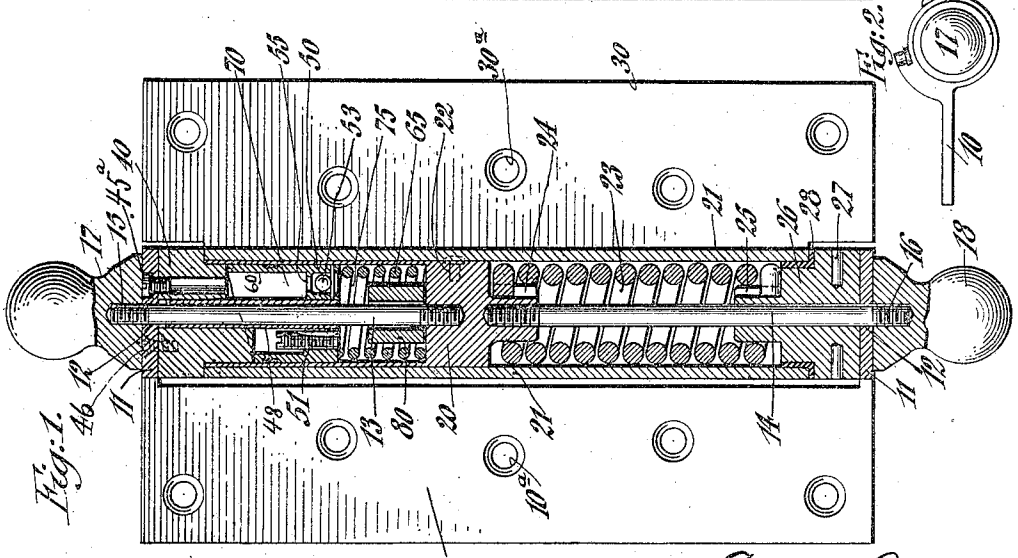


Fig. 1.

Fig. 4.

Fig. 2.

Witnesses:
Julius Roth.
F. Hogg.

Inventor
Ernie Bommer,
By his Attorney
Carl P. Goepel.

UNITED STATES PATENT OFFICE.

EMIL BOMMER, OF BROOKLYN, NEW YORK.

CHECKING-HINGE.

1,241,083. Specification of Letters Patent. Patented Sept. 25, 1917.

Application filed May 28, 1914. Serial No. 841,468.

To all whom it may concern:

Be it known that I, EMIL BOMMER, a citizen of the United States of America, residing in New York, in the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Checking-Hinges, of which the following is a specification.

This invention relates to improvements in checking-hinges, and has for its object to provide a very simple and efficient form of checking-hinge which acts in the nature of a door-check when used in connection with independent spring-hinges or other door-closing means, but which is preferably provided with self-contained door-closing means, combining the advantage and appearance of a spring-hinge with the utility of a door-check. More particularly the invention consists in the application of two co-operating cam members which move a piston member on the opening or closing of the door, and by which movement of the piston member, a checking-liquid is forced through a regulated and restricted opening of the piston member, whereby a checking action results.

The invention is shown in the accompanying drawings and will be more fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings,

Figure 1 is a vertical section of my improved spring-hinge provided with my improved checking means applied thereto,

Fig. 2 is a top-view of the embodiment shown in Fig. 1,

Fig. 3 is a vertical section of the embodiment shown in Fig. 1, but with the leaves of the hinge arranged parallel and adjacent to each other,

Fig. 4 is a horizontal section taken on line 4—4 of Fig. 3, and

Fig. 5 is a vertical section of another embodiment which is not provided with a spring-hinge structure as the embodiment shown in Figs. 1 and 3.

Similar characters of reference indicate corresponding parts throughout the different figures of the drawings.

Referring to the drawings, and more particularly to Fig. 1, the leaf 10 is provided with ears 11, which are in turn provided with pintle-openings 12 through which the pintles 13 and 14 pass. The pintles 13 and 14 are provided at their ends with screw-threaded portions and have their screw-threaded ends 15 and 16 engage screw-threaded sockets of the pintle-heads or tips 17 and 18. The other ends of the pintles 13 and 14 are also screw-threaded and these screw-threaded ends engage screw-threaded sockets of an intermediate member 20, which is secured to the barrel 21 by means of a pin 22. This intermediate member 20 serves as a socket or nut for the pintles 13 and 14, and also serves as a fixed spring-holder for the coil-spring 23 of the spring-hinge portion. This coil-spring has its upper end engaging the end 24 of the fixed spring-holder and has its lower end engaging the end 25 of the adjustable spring-holder 26, this adjustable spring-holder 26 being provided with openings 27 to enable the adjusting of the spring-holder to be readily carried out in the manner well known. A suitable washer 28 is interposed between the barrel 21 and the adjustable spring-holder 26. This spring-hinge portion as described acts like any of the well known spring-hinges, and has the barrel 21 made integral with or secured to the leaf 30. Both leaves 10 and 30 are provided with suitable openings 10^a and 30^a for the passage of the screws for fastening the spring-hinge in position.

In the upper part of the barrel 21 is arranged the improved door-checking means, which is perhaps more clearly shown in Fig. 5, to which reference is now made, as the enlarged size of the parts shown in Fig. 5 serves to make clearer the description thereof. As already stated, the embodiment of Fig. 5, however, does not have the spring-hinge portion which is shown in the embodiments of Figs. 1 to 4. For this reason the member 31 in Fig. 5 acts as a socket or nut for the pintle 32, and is also engaged by a small screw-threaded pintle or rod 33 which engages the member 31, and passes through the ear 34 which is journaled thereon, and has its other end engage the tip 35. The member 31 is rigidly connected to the barrel 43, preferably by pins or screws 36. The upper end of the pintle 32 is screw-threaded and engages the tip 37. Adjacent to the upper ear 12 and the leaf 10 is arranged a cam member 40 which has its upper surface 41 parallel with and adjacent to the lower surface of the upper ear 12,

and is rigidly connected therewith by screws 46 or other similar fastening means, and is provided with a shoulder 42 in which is seated the barrel 43 and which is provided at its lowermost side or end with a cam-surface 44. This cam member 40 is also provided with a vertical channel 45 through which the checking-liquid may be readily inserted and which is closed by the screw 45[a], which is preferably provided with a packing 45[b]. A screwdriver may also be inserted through this channel 45 to adjust the screw 51 when it is in registration therewith. The bore 47 of the cam member has a pintle 32 passing therethrough and intermediate the pintle 32 and the bore 47 of the cam member 40 is a sleeve 48, which has its upper end seated in the bore 47 and its lower end terminating adjacent to a piston member 50. This piston member 50 is provided with an adjustable opening which is adjusted by the checking-liquid regulating screw-threaded plug 51, and the piston member 50 is also provided with an opening 52 in which a ball 53 is movable. This ball-valve is shown in Fig. 5, and has the ball resting on a support 54 and is adapted to close the opening 55 when the ball is raised from the position shown in Fig. 5 to its closing position. From the piston 50 extends upwardly a hollow cylindrical portion 60, which has its upper end provided with a cam-surface 61, which contacts with the cam-surface 44 of the cam member 40. Between the cylindrical member 60 and the barrel 43, the cylindrical lining member 62, which extends from the cam member 40 to the member 31, serves to effect a liquid-tight connection. The cam-surfaces 44 and 61 coincide with each other when in one position, but when in the other position, where their peaks contact, the greatest amount of vertical relative movement is attained.

Intermediate the member 31 and the piston member 50, a coil-spring 65 is arranged, the object of which is to continually move upwardly the piston 50 so that the cam-surface 61 thereof will always contact with the cam-portion 44 of the cam member 40. The cylindrical lining member 62 is provided near its upper portion with pins 66 which are adapted to engage slots 67 on the outer circumference of the cylindrical portion 60 of the piston 50, in order to prevent a rotary movement of the piston in respect to the pintle.

Having thus shown in the enlarged view of Fig. 5 the several parts, reference is now made to Figs. 1 and 3, which show these same parts on a somewhat smaller scale. Substantially the same parts are there shown and are indicated by the same reference character.

The operation is as follows:

With the parts in the position shown in Figs. 3 and 4, which correspond to the position of the parts when attached to a door and when the door is closed, the checking-liquid is mostly all within the portion 70, that is, in the space formed by the cam member 40 and the piston member 50, and as the door opens the checking-liquid in the space 70 can flow through the opening 55 into the space 75 between the piston member 50 and the intermediate member 20 and thereby the door may freely open, as no resistance is offered to the movement of the parts. When the door reaches the position corresponding to the position shown in Figs. 1 and 2, namely, the open position, the checking-liquid has entered the space 75 and the closing movement of the leaves 10 and 30 in respect to each other will cause the checking-liquid to enter into the space 70 by reason of the downward motion of the piston 50, brought about by the coöperating cam members 44 and 61. This will immediately cause the ball 53 to rise and close the opening 55, and any checking-liquid which will then flow from the space 75 into the space 70 must pass through the checking-valve 51. This, however, is so regulated as to give a certain definite impedance to the flow of the checking-liquid therethrough. Hence, as the cam-surface 61 moves in respect to the cam-surface 44, the piston member 50 is raised or lowered, and as it is lowered, as shown in the position in Fig. 3 in distinction to the position shown in Fig. 1, the checking-liquid is forced through the checking-valve 51 gradually and with a certain resistance. The impedance thus given to the motion of the piston member 50 serves to prevent a quick closing of the door, in other words, provides a checking action.

In Figs. 1 and 3 is shown also a member 80 which consists of a loosely mounted sleeve, the object of which is to prevent the coil-spring 65 from buckling, that is, the object is to maintain the coil-spring 65 in a position so that it will always be in normal upright position and exert its full force, and will not buckle against the walls in which it is contained. To insure a liquid-tight fit, a washer or packing-ring 81 may be provided on the cylindrical member 60.

It will be noted that in all of the forms of the present invention, both the ball valves and the checking valves are disposed in the lateral head of the piston, which permits of this feature of the invention being exactly alike in all of the forms. Thus the lateral piston head will be the same irrespective of the size of the upper and lower chambers, and the valves do not depend upon any coöperation with the surfaces of these chambers for performing their functions.

I have shown an embodiment of my invention, but it is clear that changes may be

made therein without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A checking-hinge, comprising a barrel, a leaf for said barrel, a second leaf having ears, a pintle for the ears and barrel, a cam-surface member movable with an ear of the leaf, a vertically movable cam-surface member coöperating with the first cam-surface member, a piston for the second cam-surface member, a ball-valve in the piston, a checking-valve in the piston, a spring acting on the piston for forcing the second cam-surface member against the first cam-surface member, a sleeve on the piston surrounding the pintle and movable in a bore of the first cam-surface member, and a cylindrical extension on the piston movable on the interior of the barrel, the upper end of the cylindrical member being shaped to form the second cam-surface member.

2. A checking-hinge, comprising a barrel, a leaf for said barrel, a second leaf having ears, a pintle for the ears and barrel, a cam-surface member rigidly connected with an ear of the leaf and movable within the barrel, said cam-surface member being provided with a vertical channel, a screw-plug for said channel, a second cam-surface member also movable within the barrel coöperating with the first cam-surface member, a piston for the second cam-surface member, a ball-valve in the piston, a checking-valve in the piston, said checking-valve being adapted to be brought in alinement with the vertical channel of the first cam member, a spring acting on the piston for forcing the second cam-surface member against the first cam-surface member, a sleeve on the piston surrounding the pintle and movable in a bore of the first cam-surface member, and a cylindrical extension on the piston, non-rotatably fixed and vertically movable on the interior of the barrel, the upper end of the cylindrical member being shaped to form the second cam-surface member.

3. A checking-hinge, comprising a barrel, a leaf for said barrel, a second leaf having ears, a cam-surface member fixed to one of the ears and movable within said barrel, a second cam-surface member also movable within the barrel coöperating with the fixed cam-surface member, a piston for the second cam-surface member, a ball-valve in the piston, a checking-valve in the piston, a spring acting on the piston for forcing the second cam-surface member against the first cam-surface member, a checking-liquid chamber on the piston, and means intermediate of the piston and the barrel for preventing the rotary movement of the piston in respect to the pintle.

4. A checking-hinge, comprising a barrel, a leaf for said barrel, a second leaf having ears, a cam-surface member fixed to one of the ears, a cam-surface member movable within the barrel coöperating with the fixed cam-surface member, a piston member on the second cam-surface member, a ball-valve in the piston, a checking-valve in the piston, a spring acting on the piston for forcing the second cam-surface member against the first cam-surface member, an intermediate member rigidly fastened to the barrel, within the barrel, for engaging the pintle, a second pintle engaging the intermediate member, a fixed and a movable spring-holder for the second pintle, and a coil-spring between the spring-holders for the second pintle, the said second pintle and spring-holders and coil-spring being all arranged within the same barrel containing the movable piston and cam-surfaces.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

EMIL BOMMER.

Witnesses:
F. HOGG,
JOS. BISBANO.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."